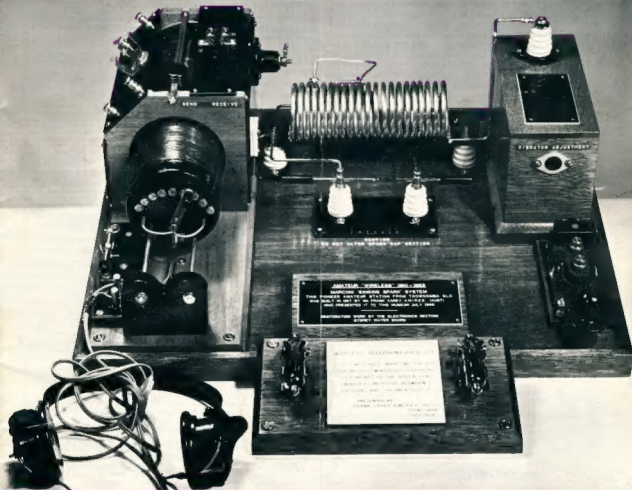


amateur radio

SEPTEMBER, 1973



• IMPROVING LOUDSPEAKER
REPRODUCTION FOR SSB

• MOBILE LINEAR FOR FT75

• HOLIDAY TIME

• MODIFICATIONS TO MR6A

• BARLOW WADLEY XCR-30

• A SAGA OF THE BUG

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

C.G.S

TYPE C MINIATURE VITREOUS ENAMELLED POWER WIREWOUND RESISTORS

Approved to BS 9114 - N002 style 2E-56

SPECIFICATIONS

The 'C' Series of miniature wirewound, vitreous enamelled resistors has been designed to meet the requirements of Specification BS 9114 - N002, and full Qualification Approval has been granted. A Test Report Summary is available on request; this report shows that many of the performance levels are in fact much higher than the specification acceptance levels.

The use of specially selected materials, combined with the application of exacting quality control throughout all stages of production ensures the consistent achievement of a very high standard of reliability.

ELECTRICAL SPECIFICATION

Tolerance: $\pm 5\%$ is standard on values of 1Ω and above and $\pm 10\%$ between 0.1Ω and 1.0Ω . For non standard values and tolerances please consult the factory.

Resistance values: C Series resistors are available with the preferred ohmic values of the E24 Series within the ranges shown in Table 1.

Temperature coefficient: Typically less than 100 ppm/ $^{\circ}\text{C}$ and never exceeding 200 ppm/ $^{\circ}\text{C}$ over the category temperature range -55°C to $+200^{\circ}\text{C}$

MATERIALS

Core: High purity steatite ceramic. Chemically inert, capable of withstanding severe thermal shock and impervious to moisture. Ground to close tolerance finish to give maximum contact with wire element for rapid heat transfer.

Resistance Element: High quality nickel-chrome or nickel-copper alloy depending on resistance value; wound at minimum tension.

End Caps: Formed to close tolerances from a special nickel-iron alloy chosen for its consistent welding properties and glass sealing characteristics.

Leads: Solder coated nickel A.

Uncoated leads can be supplied for welding.

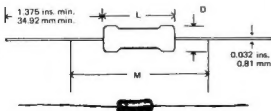
Specify - "weldable leads".

Preformed and cropped leads can also be supplied on request.

Coating: Humidity proof vitreous enamel with carefully controlled expansion matched to the materials of the resistor.

TABLE 1

C.G.S.			BS 9114 - N002							STYLE CROSS REFERENCE		
Style	Maximum wattage rating @ 20°C	Resistance Range Ω	BS 9114 - N002 Style	Maximum wattage rating @ 70°C	Approved Resistance Range Ω		Critical Resistance Ω	Limiting Element Voltage, Volts		DEF. 5111-1 Style	DEF. 5115-2 Style	G.P.O. Style
		min. max.			min.	max.		Normal	Low Air Pressure			
C3A	3	0.1 10K	2E-56-2E	2.5	1	4.7K	3.9K	100	70	RWV3J	RFH3-25	P.O.35
C7	7	0.1 27K	2E-56-6	6	1	15K	6.8K	200	140	RWV4J	RFH3-6	P.O.40
C10	10	0.1 68K	2E-56-9	9	1	68K	27K	500	350	RWV4K	RFH3-9	P.O.36
C14	14	0.2 120K	2E-56-12	12	1	100K	47K	750	530	RWV4L	RFH3-12	-



Note: M = resistance measuring points distance - below 10Ω only.

TABLE 2

Style	Length L		Diam. D		Measuring Distance M		Approx. Weight
	max. in.	max. mm.	max. in.	max. mm.	± 0.062 in.	± 1.59 mm.	
C3A	.499	12.7	0.220	5.6	1.250	31.8	1.0
C7	.874	22.2	0.315	8.0	1.625	41.3	2.0
C10	1.499	38.1	0.315	8.0	2.250	57.2	3.5
C14	2.106	53.5	0.315	8.0	2.875	73.0	5.0

amateur radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA, FOUNDED 1910



SEPTEMBER, 1973

Vol. 41, No. 9

Price, 40 cents

Registered at the
G.P.O. Melbourne for
transmission by Post
as a Periodical—
Category "B"

Published monthly as the official journal by
the Wireless Institute of Australia.

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Copy is required by the third of each month. Acknowledgment may not be made unless specially requested. All important items should be sent by certified mail.

The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying any reason.

Advertising:

Advertising material should be sent direct to P.O. Box 159, Toorak, Vic., 3142, by the 25th of the second month preceding publication.

Hamads should be sent direct to P.O. Box 150, Toorak, Vic., 3142, by the 3rd of the month preceding publication.

Printers:

Chas E. Tully Pty. Ltd.
40 Hume Street, Huntingdale, 3166.
Phone: 543 1242.

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FRONT COVER:

A typical example of the fine engineering of an early transmitter built by VK2AMI in 1920 and presented to the Queensland Museum.

Photo supplied by G. M. Hull, VK3ZS

QSP

What's in it for me?

A familiar Australian expression—one which is often heard in reference to our Institute.

What is there in the WIA for you and me?—two members of the oldest organisation of its kind in the entire world of Amateur Radio!

Chances are that I don't know you and you don't know me yet, but my sincere hope is that, through QSP, we'll get to know each other pretty well.

Although we've never met, there are, when you think about it, many things we do know about each other.

First and foremost, we're both interested in Amateur radio as a hobby or pastime; probably for vastly different reasons, but are bound by the common interest of Amateurs the world around—the desire to communicate—That we know.

Whether you are a DX man, or VHFer, a ragchewer, a newcomer, an antenna experimenter or whatever, there is always something I can learn from you.

Some new wrinkle or some benefit from your experience in communicating is readily available and willingly given—should you be asked—I know, because that's the nature of our "game" and in 28 years of amateur radio I've never been disappointed.

We're both members of the WIA, otherwise you probably wouldn't be reading this Magazine!

Now, what's in the WIA for you and me?

That's something I'm working on—the job of letting you know what's in it for us—not just you and me but the us represented by our entire membership and the us who are amateurs but do not belong to the WIA.

The Executive of the Institute has given me the task of keeping you informed about the things which the Institute does in your name—representing the Amateur Service—and about which you have a right and a need to know.

The Executive feels that, for too long, there has been a communication gap between them and you, the member.

So, every month some topic or topics will be the subject of this page to keep you in touch with Institute affairs.

Meeting each month, Executive handles all sorts of problems which are of great importance to us all in maintaining the privileges of the Amateur Service.

For example, during the two most recent Executive Meetings, considerable complex discussions took place concerning:—negotiations with the Australian Post Office on frequency allocations; the matter of reciprocal licensing arrangements with other Administrations; the formation of the VK1 Division; use of the 11 metre band, and the planned Extraordinary Convention on Repeaters.

You will hear more of these in future editions—particularly the Extraordinary Convention scheduled for September 15, which will be fully reported next month.

Executive has re-arranged its calendar, thus allowing their deliberations and actions to be available to AR within days of the meeting.

Therefore, what you see in QSP in future should be an accurate and up-to-date statement of activities at the Federal level.

Believe me, there is a GREAT DEAL in the WIA for both of us, no matter what our particular interest in radio may be.

JOHN McL. BENNETT, VK3ZA

A.R. AWARDS

The Publications Committee now have three awards available for contributions to A.R. There are the existing Higginbotham Award, and Technical Award; and to these has been added the Al Shawsmith Journalistic Award (ASJA) which carries with it a handsome plaque and a monetary token.

ASJA takes into account clarity of expression, conciseness, logicity, grammar and spelling, full and sufficient treatment of the subject matter, as well as originality and readability adjudged likely to be the best to enhance the image of amateur radio as an activity and to promote interest in it.

Although preference would normally be given to articles of a technical nature this does not exclude other articles, especially humorous articles, on a subject of amateur radio interest. Copies of articles in other publications would of course be excluded.

The Committee would like to thank Al Shawsmith, VK4SS, for his kindness and interest in putting forward the various suggestions which led up to the creation of this award.

TRANSCEIVERS — IMPORT DUTIES

Continuing the AR Special article in the July issue, Customs By-Law determinations have now been seen, or are known to have been issued, for Yaesu transceivers Models FT101, FT200, FTDX401 and FT501. Applications have been resisted however for any separate power supply unit for models without built-in supplies. One amateur received his approval only five days after sending in his application. Another amateur plans to buy his transceiver in Singapore but because of double freights, exchanges and profit quite apart from whether or not any such amateur equipment might be available "off the shelf" in Singapore he might find it just as reasonable to try the Australian import market first.

STOP PRESS AX Prefix

The AX Prefix may be used by all VK amateurs (except TPNG) from 1-10-73 to 31-12-73, to mark HM Queens Visit
PMG letter RB 4-8-1 of 23 Aug 73

11 METRE BAND

The amateur allocation on the 27MHz band is 26980-27230 kHz — i.e. 270 kHz. This allocation applies for amateur use in Australia, New Zealand and Region 2, but of course in the last-mentioned it is given over in part in the U.S.A. to the Citizens Band. It is thus easy to note why commercially manufactured amateur equipment seldom includes this band allocation. However, the band is designated for industrial, scientific and medical purposes. Other users must therefore accept any harmful interference from ISM. Radio Control (model aircraft etc.) occupies the band 26957 to 27282 kHz — i.e. 325 kHz. 27120 kHz ISM. 27240 and 27270 kHz for portable hand-phone equipment and 26978 and 27124 kHz for radio paging systems. All these are part of the general allocation for Fixed and Mobile, except aeronautical mobile, extending from 26100 to 27600 kHz.

REPEATER IN U.K.

The first repeater in G-band was commissioned on September 14, 1972 with the callign G83PI operating with a max. dc input of 150W transmitting on 145.75MHz receiving on 145.15MHz and licensed for one year experimental use. A progress report in Radio Communication for June 1973 asks "where do we go after the G83PI experiment? Do we apply for licences for one or two more repeaters in other areas? Do we try a vhf repeater? Do we want repeaters at all?"

improving loudspeaker reproduction for SSB dx

Bruce Mann, VK3BM

9 Connell Street, Swan Hill, 3585

How often have you reported that the other station would be perfectly readable if he was not buried in the static? Perhaps something can be done about it after all, rather than giving up in disgust!

The range of frequencies required for good speech intelligibility is 300 - 2200 Hz but most loudspeakers have a natural cone resonance between 50 Hz and 120 Hz. In fact a very marked resonance. You can test this by holding the speaker near your ear and tapping the cone with a finger — a bass note will be heard.

At this frequency the cone will tend to vibrate freely with any noise pulse — electrical, static, etc.

Instead of a single oscillation, when pulsed it tends to make a number of diminishing excursions.

The two methods employed in Hi-Fi to reduce this effect are (a) to load the voice coil electrically by correct matching to a low impedance circuit — i.e. by choice of driving tubes or transistors and transformer, and use of a speaker with a strong magnet. (b) to load the cone acoustically by use of a baffle or enclosure.

But in voice reproduction we do not need the bass frequencies — in fact they reduce intelligibility by masking the higher frequencies containing the consonants, which are of major importance in clear understandable speech. So why not insert a filter in the speaker leads to remove all frequencies below 300 Hz?

EXPERIMENTS

In a series of experiments I have come up with a simple filter, and a speaker enclosure which has worked wonders with "duck talk" on a noisy band. The intention was to improve reception for my faulty hearing (which falls off drastically above 1000 Hz) but visitors with normal hearing prefer the gadget switched in.

First I made a box to fit the speaker, using $\frac{1}{2}$ " Particle Board. In my case, to fit a 6" speaker the box was 8" wide x 6" high x 4" deep internally. It was lined with sound absorbent material — Tontine wadding in my case. The front, with a 4" dia. cut-out, was fastened by suitable screws, so that various available speakers could be tried.

Testing speakers without the filter it was observed that there was a marked difference between them. Those with the most powerful magnets seemed best. Just loosening the screws, thus producing a crack in the enclosure, very noticeably altered the tone and reduced the crispness of reproduction.

Then, referring to tables, a 2 stage filter was made to cut off below 300 Hz: see fig. 1.

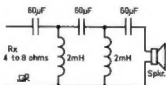
The capacitors should be bi-polar types as ordinary polarised electrolytics do not like a regular diet of A.C!

The junk box R.F. chokes that I used were rather high in D.C. resistance so I found 2 stages an advantage, but probably a choke made for the job (such as the Roia SOL 36, would be sufficient with one stage).

RESULTS

Comparing by switching between the enclosed speaker and a similar speaker on a small flat baffle, there was a noticeable loss of volume with the enclosure but a marked improvement in clarity. Static became more of a sharp crack than a rumble, and similarly with other QRN. But switching in the filter made a further great improvement by removing the unnecessary bass and further loading the voice coil.

In conjunction with a receiver having sharp I.F. filters, adjustable passband tuning, and a good notch filter, it's wonderful what it will pull out of a crowded "static" 40 or 60 metre band.



technical articles for ar

- always in demand — needed now.
- any subject of general interest.
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- long articles—short articles—medium articles
- hints and kinks.
- preferably typewritten manuscript, but handwritten acceptable.
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- spelling and grammar entirely optional; editorial staff will polish.
- drawings made by AR staff from sketches submitted.
- good, clear, glossy photos welcomed with open arms. do not forget captions.
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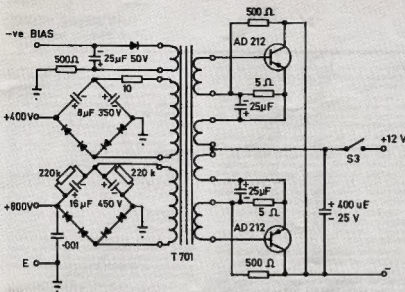
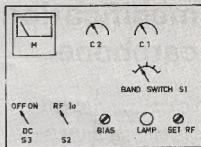
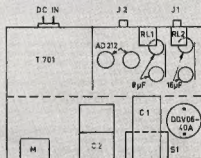


FIG 2 MODIFIED PYE POWER UNIT

NOTE. If T701 or complete unit cannot be obtained use design in "Radio Communication" Sept 1972 pp 576-7



FRONT PANEL



PLAN

FIG 3 FT75 LINEAR AMPLIFIER

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HEATH
Schlumberger

modifications to the MR6A carphone

Steve Gregory, VK3ZAC
Bob Bennell, VK3ZAC

"Lynmere", Leamonth, 3952

It appears there has been a sudden influx of the multi-channel AWA Car Phones on to disposals markets over recent months. For those who have obtained one of these units here are some notes and information on improvements to existing circuitry, and modifications to upgrade the efficiency of the unit.

Bob, VK3ZAC, has spent 6 years in the commercial servicing field and once fostered over 100 of these mobile units as part of his service responsibilities.

The basic MR6A should realize 10 to 13 watts with 1 to 2 mA grid drive to the QOE03/12. Only the exceptional units with the "right" valve combination seem to be capable of the higher power output.

The first modification attempted to the transmitting section was the second doubler stage V20 which normally used a 6C4. This was changed to a 6AK6 pentode.

An important point to remember whenever any valve substitute is contemplated in these units is the filament configuration to enable the set to operate on either 6 or 12 volts, positive or negative earth.

The filament current of any substitute valve should match the one removed otherwise the balance will be upset, resulting in a deficiency of voltage on one rail and too much on the other.

The 6AK6 power output pentode draws .15 amps at 6.3 volts which is identical with the 6C4.

A quick consultation of the valve data book shows few modifications to valve connections are needed to make the change.

The grid lead from TR10 is shifted from Pin 6 to Pin 1. Grid 3 of the 6AK6 is connected to the cathode by bridging Pin 2 and Pin 7.

The centre post in these units is used as a HT busbar, so do not bridge to earth by accident, or deliberation!

The anode circuit remains the same, as do the filaments; however Pin 6, vacated by the

grid lead, is now by-passed by a .001 uf disc ceramic and fed from the HT busbar via a 4.7K $\frac{1}{2}$ watt resistor.

The high voltage current is up by some 8.5 mA and a substantial increase in drive can be realized by connecting the anode circuit to the same 400 volt rail as the QOE03/12.

In this way the multiplier stage is keyed up along with the final. The anode coil may need 1 or 2 pF across it for resonance. This is due to the lower internal capacitance of the pentode. Drive will be somewhere between 2.4 to 3.8 mA, with 2.8 mA being the figure when connected to the 200 volt rail only. Power output should be around 15 watts.

The second stage of modification would be a distinct advantage for mobile operations or country repeater operation, and will cost around \$10.00.

It involves replacement of the final tube with a YL1240, and the driver with a 12BY7A.

The first question raised was current consumption. Would the power supply carry the increased drain from the higher power tubes? From tests on the final product we have seen that no ratings are exceeded and there is no appreciable difference between the running rail voltages in either the modified or unmodified condition.

The YL1240 is a bigger brother of the QOE03/12 and for similar drive input will give up to .30 watts output.

The large 9 pin socket is available locally and 10 minutes work will see the 9 pin ceramic socket evicted, the hole enlarged, and the new socket soldered or screwed into place. Pin 5 of the new socket points toward the first tank enclosure.

All the components and leads removed from the 3/12 socket are reconnected to the appropriate pins on the YL1240 socket. The connections are identical except that the socket is longer. A trial was given to a modified grid input circuit. Normally a 10K resistor is connected to each grid. The coil TR13 was centre tapped and fed from bias through a 1.3 μ H RFC and a 6.8K ohm resistor. Bias was identical when returned.

Next step is the removal of all components and leads from the 6C4 socket, its eviction, and enlargement of the hole to take the old 3/12 socket (if in good condition), or a new ceramic 9 pin socket.

The choosing of a tube to drive the final is open for discussion at this point. The 6AK6 could possibly drive the new final to full output without modification, but we found that it loaded the circuit too much, resulting in inadequate drive.

The 12BY7A is a sensitive pentode and gives good output when used as a doubler in this circuit. Current consumption is in the order of 25 mA plate, and 6 mA screen.

The 5763 draws 50mA plate and 6mA screen. The 7551 draws 80mA plate and 5.1mA screen when used in similar conditions.

Another point is that the facility of 12 volt filaments in the 12BY7 allows use of the 12 volt rail for a supply source. However, when the 6C4 is removed from the upper rail, 150mA drain is removed, thereby causing unbalance. V15 (a 6BH6) is elevated to the upper line adding 150mA consumption; LP1 (the pilot lamp) is connected to the lower rail and replaced by a 12 volt 1.5 watt version drawing 100 mA.

The additive currents for both rails now equal at .60 Amp each. The 12BY7 draws .30 Amp up across the 12 volt rail and the YL1240 draws .30 Amp.

With filaments now in balance, components for the second doubler stage are selected for best performance.

TR10 (the 2nd tripler stage output) would not tune due to increased capacity, so a new approach was chosen where the transformer was modified to a single wound coil, and capacitive resistive coupling was applied to the 12BY7.

A 100K grid leak was found to be too high and a 68K realized optimum drive. As with the previous modification when a 6AK6 was substituted, the screen grid is taken from the keyed HT rail via a 4.7K and .001 decoupler.

The anode circuit is fed from the HT rail via RFC and .001 decoupler.

The rewind coil on the TR10 former was 8 turns of 18 gauge enamelled copper with a 5pF ceramic across the former; the coil resonates at 73MHz with the tuning slug.

HT feed through TR10 to the 6C4 is via a 1.3 μ H RFC and .001 decoupler. To resonate the output stage of the 12BY7, a 3.9 pF was placed across the TR11 coil. By experiment the optimum output against drive was found to be when 6.8K ohm was used and 3.3mA of grid drive obtained. The previous standing bias is retained to all the stages in the driver section and no modification was needed to the final tank circuit.

The PA draws 100mA and, under bench conditions at 13.5 volts, delivers 25 watts output.

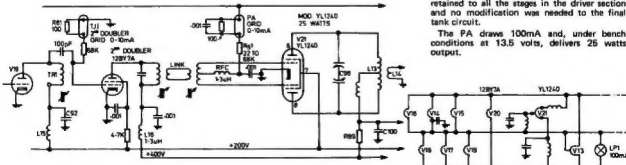


FIG. 1 MODIFICATIONS TO MR6A CARPHONE.

TABLE

Second Tripler: 6C4	Second Doubler: 6C4	P.A. 3/12
drive 0.5 mA	drive 0.75 mA	drive 2.0 mA
		Power output 12 watts
6C4	12BY7	YL1240
drive 0.5 mA	drive 0.22 mA	drive 3.3 mA
		Power output 25 watts
6AK6	12BY7A	YL1240
drive 0.65 mA	drive 1.5 mA	drive 4.0 mA
		Power output 31 watts

The figures above show the increased performance obtained and includes figures for the optional 6C4 VS. 6AK6 as the 2nd tripler, which we have not reported on, but which gives the last little bit of performance available from the system. The modification is not essential and is only listed for reference. On the second tripler socket, as with the stage 1 doubler modification, Pin 6 is changed to Pin 1 which is the grid connection; Pin 2 is connected to Pin 7 and earth; Pin 6 is fed from the keyed 200 volt rail via a 4.7K ohm and .001 decoupler.

After retuning the PA coil and grid input the extra drive conditions will be realized.

Modification to Microphone.

There are two ways to achieve rocking armature operation. One is the direct substitute of the transistor pre-amp unit designed by the manufacturers as a replacement for the carbon insert. The other is the replacement of the 12AU7 with a 12AT7 and removal of the input Transformer. Then connect the rocking armature in place of the transformer secondary.

Modifications to the Muting Circuit.

These were made to improve the time constant and audio frequency response. Instead of referring to substitution, we print the new circuitry (Fig.2) and leave the techniques of placement of the new components and replacement of the old to the discretion of the constructor.

Modification to the Front End.

This simply involves the replacement of V2, the second Mixer, with a type 6CY5. The noise figure of this tetrede is substantially lower than the pentode it replaces. Retuning is necessary and, although the book states an increase in filament current, 175A to 200A, the unbalance benefits the transmitter line, and volts are 6.1 against 6.4 for a 13.5 volt rail instead of a 6.25 balance. Inclusion of a small resistor on the lower rail will rebalance the lines.

Modification to the Power Supply.

To reduce the rise time of the switching transistors, and consequently the dissipation, the 2 feedback resistors R103 and R104 are increased from 330 Ohm to 560 Ohm, 1 watt, and across R98 and R101 are connected two back-to-back electrolytics. The values are 20 microfarad and the positives or negatives are connected together, creating a miniature 10 microfarad non polar capacitor.

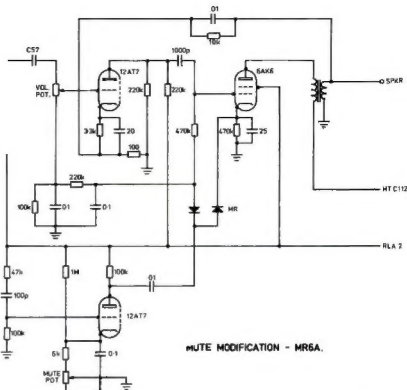
In the voltage tripler section, C112 is supplemented by an additional 24 microfarad electrolytic 450 VDCW, 600VDCS.

In our rig we also changed the two doubler electrolytics, substituting 33 microfarad 450VDCW for the existing 24 microfarad values of C108 and C109.

Conclusions

This is definitely a project for those with time on their hands; but results in an improved nice-to-listen-to rig, well behaved, and with that little extra "oomph" for the marginal contact or armchair copy across town.

Those who have heard the rig used by VK3 ZAZ mobile in country areas will probably verify that it is easy to copy and as good as any others heard. No claims to fame are made other than this, and we hope to hear some results from those who desire that little extra, without going "you know what."



MUTE MODIFICATION - MR6A.

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Thinking of going to Europe on holiday or maybe on business-cum-pleasure? David Verity of Whitehouse Public Relations, 67 Christie St., St. Leonards, N.S.W., 2086, ph. (02) 439 2511, sends along some details of holidays in Europe with DX at your fingertips. Perhaps not so many people will know about the pleasures of pottering around Europe in a caravan or motor caravan, tent or what have you. Beware however of going on a tour in summertime, especially June to September, without advance reservations. This applies also to camping sites which get very very crowded at that time of the year. Remember also there is not too much outback in Europe for ad hoc camping or overnight caravan halts.

The Club Radio Stations listed in this article most certainly are located in the very heart of Europe. More than sufficient historical places close by and such scenery as can only be described as beautiful — so long as the WX does not intervene. Literally thousands of VK's and ZL's can be found ambulating round Europe. Many take advantage of the 'off-season' period March to May — the spring — when the weather can be temperamental, particularly in the more northern parts of Europe, but how beautiful it can be when the sun shines. Apart from the places mentioned, do not forget to include a visit to 4U1ITU in Geneva if you can. The DX-tour might perhaps be more fun for a full licensee as opposed to the limited operator.

EUROPEAN HOLIDAYS FOR AMATEURS

A group of active Radio Amateurs from four different countries recently launched a new venture called TOPTOUR HAM CLUB. The club plans to offer all licensed amateurs the opportunity to enjoy their hobby during their holidays.

Many countries already have reciprocal agreements which permit foreign amateurs to obtain vacation licenses in the host country. The Club is in a position to secure such vacation licenses or assist in procuring such documents.

In order to assist the amateurs in their amateur activities the Club has established facilities in a number of holiday centres in Europe. All club Stations have been placed in first class hotels.

At this time there are Club stations operating in SWITZERLAND, GERMANY, LIECHTENSTEIN, PORTUGAL and AUSTRIA.

Moreover, the club can make available VW Campers with mobile amateur station built-in.

Any licensed amateur from Australia is eligible for guest membership.

Toptour Ham Club has close relations with SWISSAIR and several well-known Travel Agencies. As a result it can provide the vacationing amateurs "tailor made" holidays at the lowest prices.

TOURIST PROGRAMS

The travel program can be arranged according to the needs of the vacationing amateur and his family. Rates are based on a minimum stay of 7 days at each Club Centre (minimum in Portugal, 14 days). It is also possible to provide for interruption in the program to allow the amateur to use part of the time for business purposes. Places other than the listed Ham Club Centres may also be visited and included in the program.

ACCOMMODATION & MEALS

All rates quoted are based on rooms with double occupancy, with or without bath, in selected hotels or in a Club House. The rates at most destinations include 2 meals (continental breakfast, plus either lunch or dinner), and Toptour Ham Club will undertake to secure the vacation amateurs licenses and assist in making the necessary application. The vacationing amateur will get his own licenses and call letters for each country to be visited. Any fees for these are included in the overall prices quoted.

However, it is understood that due to the considerable time needed to obtain licenses and call signs for the vacationing amateurs, a complete questionnaire, and photostat or Xerox copy of the home license (for Portugal the original, which will be returned) need to be completed and sent at the time of booking but not less than 2 months in advance of departure for Portugal 3 months.

THE VW — CAMPER

A comfortable vacation home on wheels, the camper provides room for 3 grown-ups and 1 child. Radio equipment consists of an FT 101 (Sommerkamp 277) for 5 bands, CW and SSB with 240 Watt PEP input, a Drake W-4 HF-Wattmeter, an electronic key (ETM2). A dynamic mike is also provided. There are two loudspeakers: One in the living area, the other above the driver's seat, built into the roof.

The antenna is a roof-mounted HUSTLER mobile antenna. The station can be switched to AC current for stationary operation on camp grounds.

All the station gear is conveniently arranged on a modern desk. The YAESU FT DX 400 is mounted on top of a speaker console. The entire 5-band 80-10m rig, operates on CW, SSB and AM with a full 500 Watts PEP input. A DRAKE W-4 WATT-METER allows the continuous checking of the HF output, as well as the Monitoring of



Overlooking Bregenz, Austria, the new Top Tour QTH for this area is the Berghof Fluh perched on a mountainside overlooking Lake Constance.

the SWR. There is also a high-level output DYNAMIC DESK STAND MIKE with touch control bar for easy PTT operation, and for the CW man a modern ELECTRONIC KEYS ETM 3 also permitting squeeze keying.

Additional conveniences afforded are: A DIGITAL CLOCK, a HIGH INTENSITY READING LAMP and a set of HIGH QUALITY EARPHONES. The small SWITCH PANEL BUILT INTO THE DECK, HOUSES THE MAIN SWITCH for the station with a SAFETY LOCK AND KEY, as well as a CO AX SWITCH for the antennas and the 50 Ohm DUMMY LOAD.

Depending upon the location of the individual Club Stations one or two of the following antennas are used: — FB 53 JUMBO BEAM with 5 elements on 10-15m and 3 elements on 20m, driven by a HAM-M ROTOR and activated through its well known control box.

— FD 4 WINDOW ANTENNA with a coax-feeding for 4 bands, generally used for 40-80m.

The entire station is laid out with comfort and convenience in mind.



Sub-tropical is the only way to describe the Swiss club of Lugano, the southernmost city in the country. Located south of the Alps, dipping deep into Italy this Tour location offers the best of Swiss and Italian hospitality.

THE STATIONS

HBS: Bad Ragaz — (Club Radio Station No. 1)

BAD RAGAZ is world famous for its mineral springs. It is a health spa of the first order with Thermal baths and the best medical facilities. The town has numerous attractive parks, and endless possibilities for vacationers who like sports of any kind. Golf (18 holes) mini-golf, horse-back riding, swimming, fishing, flying and soaring, skiing and mountain climbing.

HOTEL CRISTAL CH — 7310 BAD RAGAZ

This is a new Hotel with its own enclosed swimming pool, sauna (Swedish steam bath), large restaurant, large lobby, bar and reserved Club Room with Radio Station.

Other world famous tourist centres can be reached by train or car in a relatively short time. St. Moritz, Pontresina, Davos, Klosters and Arosa.

HBS QTH: ZWEISIMMEN

Surrounded by Pre-Alpine meadows, forests and mountains, this is an ideal spot for recreation, rest and summer and winter sports. There is a new heated swimming pool, tennis courts and mini-golf courses, beautiful fishing streams, and an enclosed gondola-type chair lift to the top of famous Rinderberg.

(6,200 ft.), trains and a ski school.

**QTH - HOTEL KRONE CH-3770
ZWEISIMMEN**

The Hotel is modern, centrally located, yet quiet. Sunny meeting rooms, bar, banquet room, beautiful garden open to guests, garages, orchestra and reserved Club Room with Radio Station.

HBS: QTH: LUGANO

In the southernmost part of Switzerland, Lugano is near the Italian border, with mild climate. It is one of the loveliest spots in Europe and offers the tourist every facility.

QTH - KINGS HOTEL CH-6900 LUGANO

This is a modern "skyscraper" with large restaurant, meeting rooms, bar, garage in the basement and reserved Club Room with Radio Station.

Excursions - By car or train to Locarno, Ascona and the Italian cities of Milano, Como and Varese. Sight-seeing trips by boat to a number of quaint and interesting places along the shores of the lake.

HBQ - QTH: GAMPRIN, LIECHTENSTEIN

Tiny Liechtenstein is a separate and independent country, which is ruled by Duke Franz Josef II. It is situated in the Rhine Valley between Switzerland and Austria and is only about 17 miles long and 5 miles wide.

Gamprin is a small village on a hill in the middle of the Rhine Valley, about 7 miles from the Capital, VADUZ. This is an ideal spot for DX men.

QTH - FORSTHAUS VALEPR - SPITZINGSEE, GERMANY

A historic Inn, surrounded by woods in the Bavarian Mountains, close to the border of the Tyrol. It features a rustic atmosphere, large, friendly rooms with pine-panelled walls.

The Radio Shack here features a COLLINS 76 S-3 plus LINEAR with 3KW input, a Beam and Vertical Antenna.

QEG - QTH: BREGENZ, AUSTRIA

The picturesque town of BREGENZ is situated at the east end of Lake Constance, where the Rhine River flows into the Lake at the point where the three countries Austria, Germany and Switzerland meet.

A variety of entertainment is available to the tourist, mini-golf, boating and water-skiing, sailing and fishing.

QTH - HOTEL BERGHOF - BREGENZ, AUSTRIA

This modern Motor Inn is located on a hill overlooking the town of Bregenz. Its view of the Austrian, German and Swiss mountains is truly unique and awe-inspiring. It is a new Inn with an excellent restaurant, a huge terrace, Tap Room, Bar-In-The-Rocks, Reserved Club Room with Radio Station. Rooms, modern with bath, phone and balcony.

The Radio Shack features Beam and Rotor; also a separate antenna for the lower bands.

CTI - QTH: ARMACAO DE PERA, PORTUGAL

Armacao de Pera is situated on the southern coast of Portugal in the Province of Algarve, about 30 miles west of the airport of FARO.

QTH - TOPTOUR CLUB HOUSE, PORTUGAL

The Club House is located on the beach and contains 4 double rooms and 1 single room. The large radio shack is enclosed and has a 5 element Beam and Ground Plane Antenna. ●

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audio rectification hints

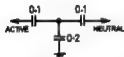
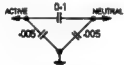
R. S. Gurr, VK5RG

Reprinted from VK5 Journal, January, 1972

Just like Channel O interference, when amateurs get into audio frequency amplifiers, nothing can be done at the amateur rig to cure the problem. A passing taxi or a nearby two-way service could cause the same problem, but it is usually the amateur that gets the neighbors' wrath. If affairs are friendly, and you haven't been abused, and you feel you would like to help the guy, perhaps only for the technical exercise, here are a few hints on possible cures.

POWER LEADS

Once believed to be the main source of R.F. input to audio-stereo systems. With valves, it was, but in this day of solid state, very likely no problem. An Aegis MF2A line filter can resolve some cases and will reduce audio pops and clicks — a simple backyard line filter can be improvised by twining the excess cord through a circular ferrite, perhaps an old TV deflection yoke core. A 10' length of 3 x 23/.0078 flex tube entwined with loose plugs and sockets can be used for the chores of an experimental line filter. To accompany these, some "jumbo" type double adaptors with the following condenser combinations should be made.



An experimental lash-up should give you a lead to the best type of filter. In extreme cases the above capacitor combinations wired direct to the power transformer may be necessary. Often a direct earth from the radio chassis to the ground is all that is required — this could apply especially to some imported equipment where the manufacturer has ceased to include electrostatic shields in power transformers.

OUTPUT LEADS

Although we would be led to believe that the speaker leads on modern hi-fi combinations are shielded wire, a survey reveals this is only so in a few cases. Long open speaker leads are good serials, and will conduct RF back into the sensitive pre-amplifier circuits, where it is rectified and amplified.

Most commercial units use either screw-on or RCA type connectors some have been found using 3.5 mm plugs and standard headphones type plugs for this purpose. With screw-on connectors, a 0.1uF polyester or ceramic capacitor direct across all speaker output terminals, at the connector strip, will stop speaker lead pickup in most cases. A useful item to help try this same cure on sets using RCA or other jacks is to have a couple of adaptors already made up, so that they may be plugged in series with the loudspeaker leads.

NEVER do this switch-over with the set switched on — open circuits on output stages are still disastrous!



INPUT LEADS

With the use of transistors, the need for intimate shielding of all circuits is reduced, providing the hum field of the power transformer is made insignificant. As a consequence it is not unusual to find input leads from pickups that are not shielded. A 0.005 or so disc ceramic on a plug adaptor is useful if the input connections are removable. If they are not, it will be necessary to start bypassing at the first available point nearest the amplified input. The number of input combinations to be met are many. However, it will be necessary to bypass at least the input terminals on the PCB, if this cannot be done at the chassis input terminals on the PCB.

In extreme cases, changing the pickup leads to double screened wire will help, and may also give reduced hum from the motor field. Use a series RFC to the input elements, and 0.005 bypass capacitors are often used.



OVERALL EFFECTS

With input, output and power circuit pickup reduced to a minimum, the remaining RF pickup, if it still exists, is by direct receiver wiring and board pickup. You really are in for fun if you need to go to the extent of lifting components from a PCB to install series filters. It may be necessary, but try every means of shunt bypassing before you attempt this, as it is so easy to upset the bias conditions and so hard to fit the parts back in — even ferrite beads become difficult to fit sometimes.

Direct pickup by wiring is best tested back in the freedom of your own home shack/workshop. Most of the previous tests can be conducted in the owner's lounge room. A 27 MHz handphone, or a signal generator with a probe, or even a GDO with 50 Hz modulation, may be of assistance. The portable source as described above, should be moved about over the pre-amplifier section of the wiring and the areas where intensity of interference is great should be noted. This will be near unscreened volume control leads, and either bypassing of the next input element (0.001uF) or screening the leads, or both, will be necessary.

If it is proved that RF close to the board is being rectified, but it is hard to pick the exact element, cover the section with paper held down with masking tape and then screen the lot temporarily with "Alfoil". At your leisure you can then peel the metal away in parts and see which area is the most sensitive to its removal.

CONCLUSION

The above brief notes may be of assistance to anyone about to attempt the de-lousing of an audio TV-stereo-radio-gram system, although they are necessarily incomplete. It is difficult to

discuss the aspect of receiver-audio design with servicemen, manufacturers' representatives, and the manufacturers themselves. Apparently due to lack of legislation on receiver design standards, this aspect is continuously overlooked. Remember, however, the same trouble can be caused by any other AM or SSB transmitter that may be set up close to the amplifier in question, consequently the burden of cure should not necessarily be the amateurs.

If you have TV or audio appliances in your home that suffer no interference, your invitation to an inns neighbor and his uncomprehending technical advisor to visit and observe for themselves is a good way to start to improve relations. There is a "no man's land" existing in this area, and since usually the amateur is the only one involved who understands RF, perhaps if he got off his tall and offered his assistance early in the piece, rather than procrastinating on legal points, he would improve his public image.

REQUEST

The writer would welcome details of case histories, mainly technical, on methods of cure. I do not require any further information on the legal aspects, or how nasty some neighbors can be!



Station 2W1—the official station of the N.S.W. Section of the Wireless Institute of Australia, is 1923. Many components for both amateur and commercial experimental stations were 'home built' in these days and this illustration is typical of an experimental station of the time. It was built by a member of the Institute named James and installed at the residence of Mr H. A. Stowe, 2121, until 1925 when it was transferred to Mr Basil Cook's residence. Basil Cook operated as 2X20P.

New MIDLAND Products on order for the future "NOVICE" Licenses

MIDLAND model 13-869 5 Watt 23-channel crystal controlled, frequency synthesized 27 MHz transceivers, all crystals included, 12 to 13.8 V DC operation, noise limiter, S-Meter with mobile bracket, dual-conversion receiver, with P.T.T. microphone, all for only **\$90**

MIDLAND model 13-894 5 Watt AM-SSB combination transceivers 27 MHz & 23 channels crystals provided, 12 to 13.8 VDC operation noise blanker, selectable sideband switch, clarifier squelch control, S-Meter, mobile bracket, with P.T.T. microphone, containing 29 transistors, 3 FET's, one IC and 53 diodes, all for only **\$175**

Further MIDLAND PRODUCTS

One Watt hand-held standard 27-28 MHz walkie-talkies, two channels model 13-700 each **\$40**

One Watt de-luxe walkie-talkies, 27-28 MHz, three channels, battery-meter and extra sensitive receiver, **\$50** each
Crystals for various 27 MHz channels, also 28.1 to 28.5 MHz, per pair **\$3**

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P.T.T. hand-held dynamic 50 K ohm impedance microphones, sturdy metal case with coiled cord, **\$10**

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TH 3 JR 10 15 20 M 3 el junior Yagi beam 12' boom **\$100**

TH 3 Mk 3 10 15 20 M 3 el 1 KW Yagi beam 14' boom **\$145**

TH 6 DX 10 15 20 M 6 el 1 KW Yagi beam 24' boom **\$175**

HY-QUAD 10 15 20 M element Cubical Quad 8' boom, single leadline **\$130**

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NOTE Some price reductions since last month although today, 1 August, 1973, two weeks after the Government's 25 per cent Tariff Cut, I still have to pay full 45 per cent import duties (1) on new imports **ARRIE BLES**

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Extra crystals **\$8** per channel

BELCOM LINER 2 Solid State 144 MHz SSB transceivers, 10 Watt output, 12 V DC operation on VXO coverage 144.000 to 144.240 and 144.240 to 144.480 MHz, with clarifier, noise blanker squelch, mobile bracket and P.T.T. microphone, 27 transistors, 6 FET's one IC and 44 diodes **\$350** **\$330**

SWAN TV-2C 144 MHz transverter, 28 MHz input 240 Watt PEP output on SSB, receiver convertor noise figure less than 3 db with two FET rf stages and FET mixer 5894-B transmitter output stage, to be powered externally from the supply of the driver-transceiver **\$450** **\$430**

SWAN VHF-150 144 MHz linear amplifier, 150 Watt input on carrier with only 2 Watt drive, built-in 240V AC powersupply, with input output relays to by-pass linear on reception, optional Class C operation for FM and CW or Class B operation for SSB, twin-tetrode RCA 5894 B **\$375**

YAGI ANTENNA 9 elements 144-147 MHz, 9' boom with gamma-match fed radiator perfect 52 or 75 ohm match locally produced complete **\$30**

ON ORDER solid state 144-148 MHz amplifiers, 12 V DC operation, no switching required for use with transceivers, using tuned input and output lines and diodes switching. Also, 144 MHz meshhead receiver pre-amplifiers, can be left in circuit unhindered on transmission, giving 12 db gain when switched to reception at very low noise figures, 12V DC.

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GALAXY RF-550-A 0 400 and 0-4000 W in line meters, with 6 position built in coax switch **\$75**

SWAN VM-1500, 4 ranges 5 to 1500 Watt rf power in line meter **\$50**

NOISE BRIDGES **OMEGA T** antenna noise bridges, 0-100 MHz indispensable for intelligent antenna work still only **\$25**

(see E.A. July 1973)

YAESU-MUSEN HF SSB TRANSCEIVERS

Four latest models kept in bond storage in Sydney approximate prices quoted for supply with approved BY LAW (import duties exemption) application, bond-storage and -clearance and -documentation charges which are presently unknown and may vary from case to case, are **extra**

FT 101 **\$500**

FT 200-FP 200 combination **\$325**

FT DX 560 **\$400**

FT DX 401 **\$475**

North Queensland Convention 21st-22nd July, 1973

The Saturday evening dinner dance was attended by 120 people. Highlights of the evening was the after dinner talk by Newton VK4QW, Peter VK4QD, President of the Townsville Amateur Radio Club is shown presenting honorary membership of the Club to Newton with a suitable memento of the occasion.

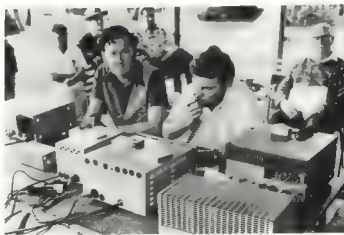


Left—
The commercial display of SSB equipment by courtesy of Fred VK3VB, was well received and many amateurs stood gazing at it with that far-away look in their eyes.

Below—
Ron VK4ZLC broadcasting the Queensland Divisional news on Sunday 22nd July from the North Queensland Convention. On the left is Peter VK4QD, T.A.R.C. President. Behind is Newton VK4QW waiting to make the call-back on 14MHz.



Left
Evie, VK6EQ, hostess for the Saturday evening dinner dance, cutting the VK4TC cake.



a review of the BARLOW WADLEY XCR-30 MARK 2 receiver

— A review by the AR technical staff.

The Barlow-Wadley Receiver has already been the subject of two technical reviews: firstly in the RSGB magazine "Radio Communication" for January 1973, and also in Electronics Australia for May 1973. In this review it is proposed to give a picture of the receiver in operation at a typical amateur station by comparing it with some of the better known pieces of amateur gear.

The "Barlow" is a general coverage receiver with a frequency range of 600kHz to 30 MHz effectively in 30 bands each of 1000 kHz. It does not employ any form of bandswitching, the appropriate range being selected by a MHz dial calibrated from 0 to 30 MHz. The kHz dial is calibrated at 10 kHz intervals, the actual divisions being spaced approximately 2 mm apart. The receiver is complete in itself, the cabinet measuring 292mm wide x 190mm high x 88mm deep (11 1/2" x 7 1/2" x 3 7/8"), and the weight including batteries is 4.14kg, or 9 lbs. 2 oz. Reference to the photos shows that the set has the appearance of a typical large Japanese portable receiver, but it is, in fact, manufactured in the Republic of South Africa.

Front panel controls, apart from the MHz and kHz dials, include an antenna trimmer which actually tunes the front and throughout the entire range from 800kHz to 30MHz; an SSB clarifier control giving a "band spread" tuning over about 6kHz; a mode switch to select either upper or lower sideband, or AM reception, and a combined off/on volume control. There is also a calibration re-set control, and a small tuning meter.

The "Barlow" operates on the Wadley Loop principle which is also used in the well known Racal receiver and also in the locally designed Delta-Het receiver, in order to cover the 30 MHz range, the front end oscillator is tunable

from 45.5 to 74.5 MHz. This is then mixed with the harmonics from a one MHz crystal in a complex system to produce output into a tunable IF range of 2 to 3 MHz. A 455 kHz IF section follows, which includes two ceramic filters, one giving 3kHz selectivity for SSB, the other 8kHz selectivity for standard AM reception. Both diode and product detectors are provided, the appropriate one being selected by the mode switch. The audio stages are quite conventional and provide in excess of 5 watt output into the built-in speaker or to a 3.5mm output socket for external headphones or speaker.

Before proceeding to "on air" impressions, here is a run down on the more important specifications.

Frequency Scale Accuracy: Within 5kHz, at all frequencies.

Restating Accuracy: Within 1kHz, at all frequencies.

Selectivity: 6kHz, overall on AM, 3kHz, overall on SSB.

Frequency Stability: Will hold an AM transmission in tune indefinitely, and an SSB transmission on pitch for long periods of time.

Sensitivity: Antenna circuit thermal noise audible at all frequencies.

Image Rejection: 60db on all movable image channels. 60db and better on immovable images.

Current Consumption: 20mA, quiescent from 6 internal "D" type cells.

THE BARLOW UNIT

Initial operation is simplicity itself. To set the receiver to any given frequency it is only necessary to move the MHz. dial to roughly indicate the whole number MHz range, then move the kHz. dial to the required frequency. The exact frequency is then determined by

simply adding the two readings together. It might be thought that the setting of the MHz. dial is a critical process, perhaps in the style of the old band set, band-spaced, receivers of bygone years; however this is not the case at all. The action is more related to a switch than to a continuously variable control and when a signal is located, it is only necessary to move the MHz dial slightly back and forth to peak the signal. The frequency does not vary in any way at all.

For the purposes of our tests, the Barlow was operated on its inbuilt telescopic whip antenna with no external connections at all. The comparison receiver used was a Collins 7553 connected to a tuned, long wire antenna. One of the first things noted was the difficulty in tuning SSB using the kHz. dial alone. The drive ratio is this is only two to one and, although a large edge type control is provided, it was more good luck than good management if a signal was resolved immediately.

However, it is not intended that SSB signals should be resolved on this dial. The clarifier control provides smooth and easy resolution once the signal has been located. When the process has been mastered, tuning becomes very easy and SSB signals could be located almost as easily as on the Collins. The overall sensitivity of the Barlow on its own whip antenna is quite incredible. On the 20 metre band any signal over S3 on the Collins was readable on the "Barlow". The addition of an external antenna to the "Barlow" made only a small improvement, possibly due to the difficulty in obtaining an impedance match into the external antenna connection of the receiver.

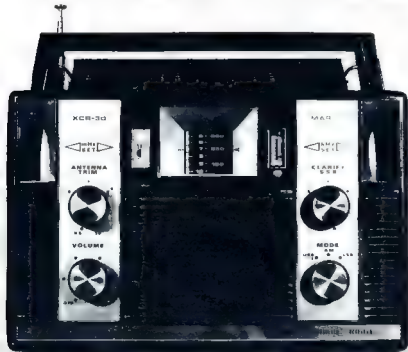
At 7 MHz and lower the Collins pulled away in sensitivity from the "Barlow" and it was found that either an earth or external antenna was needed to restore full sensitivity. Stability of the receiver was also most impressive. In the SSB position, drift did not exceed 400Hz, from a cold start, over a period of several hours operation. Most of this drift occurred during the first half minute due to shift in the BFO, the actual drift in the front end oscillators being so low that it was difficult to measure.

One surprising discovery was that the set caused quite a bit of TVI on both Channel 0 and 2 when tuned around the one to two MHz. range. This occurred when the "Barlow" was used within a twenty-foot radius of the TV receiver. If you live in a low signal area this could be a problem. Also it seems that strong signals from Channel 0 and 2 can cause birds on the "Barlow" when tuning around the one to two MHz. region. However when used in average locations these effects should not present too much of a problem.

To sum up then, the "Barlow" receiver appears to outperform all other general coverage receivers in the price bracket around \$200. It would be hard to imagine a better receiver for the short wave listener.

However, to use the "Barlow" as an amateur station receiver presents a few problems. Firstly, some means of muting would have to be devised, preferably a system that left the BFO operative in order to eliminate the initial switch-on drift. Secondly, and it is perhaps only a minor point, the appearance does not fit in with normal amateur gear.

The Barlow-Wadley XCR-30 Mark 2 receiver is currently available from at least one of the advertisers in AR.



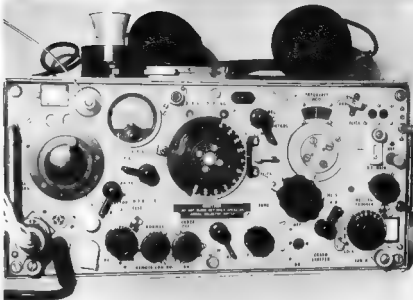
transceivers used by amateurs post-war

Rodney Champness VK3UG

44 Rathmullen Rd., Boronia, Vic., 3155

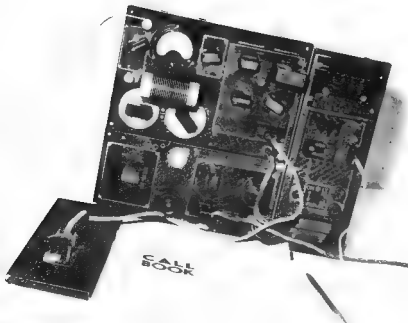
122 TRANSCEIVER

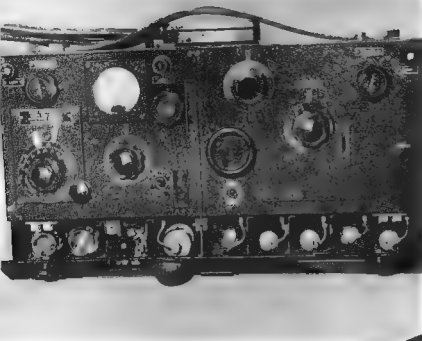
The 122 transceiver was possibly the most used of the WW 2 ex army transceivers. It covered 2 to 8 MHz in two bands, which meant it covered 80 and 40 metres with no modification. On CW it had an output of 12 to 14 watts and on AM, 7 to 8 watts. The 122 was one of the few sets which had plate and screen modulation, in fact a 6N7 was used in Class B to modulate the 807 output valve. It nominally operated from a 12 volt battery and featured, for its time, one of the lowest current drains on receive of any similar transceiver. These sets were VFO and crystal controlled.



TYPE 3 MK2 TRANSCEIVER

The Type 3 MK2 was designed as a "spy" set for use in occupied territories. These sets used a very versatile power supply and were capable of operating from 6 volt DC and from 110 to 240 volts AC. Their frequency range is from approximately 3Mhz to 15Mhz so covering 80-40-20 metres. This is purely a CW unit and an output of 14 to 15 watts could be expected from the 8L6 in the final. Many of these were modified to fit a plate and screen modulator so making them more useful for the average amateur. This set was crystal locked on transmit and fully tuneable on receive.





FS6 TRANSCEIVER

The FS6 is one of the few transceivers that appear to have a wholly Australian history. It covers, in its original form, 4.2MHz to 6.8MHz. They were easy to pull onto 40 metres and some chaps got them going on both 80 and 40 metres. They worked off a 6 volt battery and used a combination of battery style 2 volt valves and one 6 volt valve namely a 807. This is a AM/CW transceiver although it does use grid modulation in the AM mode. The output power on AM was 4 watts and on CW 8 watts. The transmitter and receiver were both fully tuneable.

These three sets were probably the most popular of the transceivers which came onto the market after WW2. The sets no doubt were used in many a Remembrance Day contest. These particular sets were photographed in VK3UG's museum by Cyril Maude VK3ZCK.

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Newcomers Notebook

with Rodney Champness VK3UG

44 Rathmullen Rd., Boronia, Vic., 3155

As stated last month I intended to build up a signal injector. Strangely enough I did build it, and it took all of half an hour to complete.

YRCS TRANSISTORISED SIGNAL INJECTOR

Bob Callander and his helpers in the projects section of the Youth Radio Club Scheme have been at it again with another winner of a project. The first project was a BFO kit which sold for \$2 plus 30c postage. Bob informs me that they have sold 100 of these kits. The signal injector that I built is their second project. I timed my construction time as noted above. I believe that depending on your skill in wiring construction it should take between 15 minutes and an hour.

A lot of thought goes into the design of these projects so as to present a simple, cheap, and effective piece of equipment. Once again they have succeeded. The signal injector is constructed on a small piece of matrix board, and the whole thing fits in a small plastic tube. Used, large hypodermic syringes are ideal for this job, as they have a rubber bung at one end and a small tube leading out the other to act as the probe outlet sleeve. Everything is in the kit to complete the job with the exception of a few inches of hookup wire and a couple of inches of solder. There are two NPN silicon transistors, 4 resistors, 3 capacitors, matrix board, a penlite cell and the plastic case — plus comprehensive construction information. Bob (VK3AQ) indicates that future kits will have hook up wire and solder.

I found that the injector did not draw all that much current, in fact my unit drew about 0.2 ma. I decided to experiment a little with the collector resistor values which are 10k ohm as supplied, and gradually reduced them to the region of 2.2k ohm. This did in fact increase the output of the unit to a more useable level for some types of circuits. Mine finished up drawing about 0.6ma.

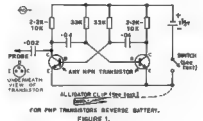
The on-off switch for the injector is formed by twisting and untwisting the lead to the negative terminal of the battery. Crude maybe, but it must be remembered that the signal injector will not be used every day by the average experimenter, so it will last a long time and is cheap.

Another advantage having the negative lead come outside the unit is that it can be clipped on both ends; one end clipped to the negative terminal of the battery and the other to the earth of the equipment under test. This brings up the effective output for some types of circuits where sensitivity is low or the impedance is low. Now one caution when the earth lead is used during the tests. NEVER use the earth when testing high voltage equipment. Why you might ask? If the earth lead is connected and then the probe is placed on a component operating at say 200 volts above or below earth, a very high damaging spike of current and voltage will appear across the probe capacitor and the transistor. These share the voltage in inverse proportion to their capacity. The probe capacitor has a value of 0.002µf and the transistor has a value across its junctions of

maybe 10pf. The transistor may have to stand momentarily 190 of the 200 volts. The type of transistor used in such a project as this will not normally have a rating above 40 volts Collector to Emitter. If you do not observe this warning you will ultimately find the injector just does not work. One or both transistors will have expired. I know, I had to find out the hard way. You do not have to! If you do use it on valve equipment, use it without the earth or, alternatively, only put the probe on parts of the circuit where the potential to earth is no more than about 20 volts. For instance the grids of most valves will be a safe place.

I have only two small criticisms of the injector, or more precisely the information supplied. The circuit drawing is hand drawn, and the pin connections of the average transistor are not included. Other than that I can do nothing other than recommend this kit for any newcomers or, for that matter, some not-so-newcomers like myself. The YRCS are selling the injector kits for \$2 plus 20c postage. They are available from Bob Callander of 383 Warrigall Road, Burwood, 3125.

There is one possible fault you may strike with the injector. Sometimes it will not work, and not for the reason mentioned previously. The leakproof batteries in vogue at the moment have a double bottom and sometimes these two layers of metal don't make contact — therefore no voltage. These batteries are designed to be used under slight compression. Some of the Japanese batteries appear not to be double bottomed and it may well be preferable to use them as replacements when the time comes. Figure 1 shows the circuit of the injector and the base diagrams of the transistors. As can be seen the circuit is simple and can form the basis of many other simple projects.



USING THE INJECTOR AND HOW IT WORKS

Next month I hope to show you how a signal injector works, and how it can be used to fault find the audio and RF sections of equipment. It can even be used as a tone source for a Morse code practice oscillator or for the modulation on an A2 type transmission. Do you know how a device which is oscillating at say 1kHz can be used on RF circuits? Wait for next month's instalment.

ODDS AND ENDS

The RF probe in the June Newcomer's Notebook can have one extra component added to prevent destruction of the OA91 diode. When this probe is used on circuits with high DC voltages to earth the same problem as I warned you about regarding the signal injector and high voltage can occur. To overcome this problem, I drew the circuit such that the high voltage pulse from the plate circuit of a valve transmitter stage will cause the diode to conduct — not

be reverse biased. To be doubly sure an NE2 neon indicator worth about 25c can be placed across the OA91 diode. The striking voltage of the neon is lower than the Peak Inverse Voltage rating of the diode. The diode should then last for ever, theoretically, as long as you do not put too much RF through it.

If you are an amateur how do you monitor your signal? You are required to do so according to regulations! There are many ways of doing this, but can your monitor tell you anything about your signal other than it sounds alright? Can you tell, for instance, how much modulation you have on your AM set, or are you flat topping on SSBT? Can you be certain how much deviation you have on your FM set? I will be very interested to hear what you say, because I believe that there is a dearth of good station monitors that are simple and effective.

"The Man from Snowy River," by Alan Shawsmith VK4SS.
(With apologies to Australia's Immortal Bard — A.B. 'Banjo' Paterson. Author of 'The Man from Snowy River' and 'Waltzing Matilda')
Then I saw the man from the Snowy River
That came across my road
And from other sources, 't was worth a thousand pounds
And from other sources, 't was worth a thousand pounds
All the road and rare DXers from stations near and far
Had mustered on the main bands overnight.
For gentlemen love hard fighting when here the races are,
And put their rigs to bed with swift dispatch.
There was Harrison who made it when he won the CO op.
An old man with hair as white as snow,
But how could say he was when his blood was fairly up:
He'd go where his DX and his rig could go.
And Glancy of the Overflow came on to try his hand,
No better code man ever held a yard.
For one who had been there when the hatted rig would stand —
The Overflow had taught him well, you see.
And one called in, a Novice with a small and weedy rig:
Something like a GPRP undercard.
But built to stand the climate and those tested for it's rig.
Gear that a by mountain DXers prized.
But still so small and tiny, one would doubt it's power to stay
And the old man said, "That rig'll never do."
For a long and tiring contest laid 'You'd better give away.
A two day test is far too much for you."
So he waited, sad and wifely — only Glancy stood his friend,
"I think we ought to let him in," he said.
"I warrant he'll be potshot with us right until the end,
His rig's homebound but he is mountain bred."

They found the DXer on the first big pile up clump
And called hard from the mountain brow.
The old man gave the orders — "Boys, go to 'em from the jump.
No use to try for fancy working now."
So Glancy tried to work him — he was breaking on the wing.
Where the best and bestest DX'er value their prize.
He turned his beam toward them and he made the ranges ring.
With a keyer as fast as thunder it came to face.
But the DX'er was not there, the prize was deep and black,
Remounted to the thunder of its own race.
And the DX'er wailed the echoes and was lacerated answered back
From the loneliness pulsating in the sky.
When they needed the half size mark, ever Glancy took a pull
The game would make the bravest start, relay.
The DX'er lay thickly but still the bands were silent.
Or modified ops urged on by victory's scent.
And the old man muttered loudly, "We may find the most good-day
No man can hold them now from here."
But the Ham from Snowy River wouldn't give the game away.
He'd been there when the bands were in a lull.
He was still among the callers as the bug began to rest —
And other mountain Hams now sitting mute.
Heard him play the happy laser, he was right amidst the best
He was alone and unopposed, not the day.
Then they lost him for a moment where two S9 signals met
And widely spread — but a final glimpse was seen.
On his rig and higher frequencies, the rare ones calling yet.
With the Snowy River Novice on their heels.
And he logged them — now he logged them. Till he made the GSO
He followed into a bloodhound all the way.
With a pace that never slackened — and as the records show,
He alone and unopposed, not the day.
But his happy mountain rig now could scarcely raise a watt.
The PA tube was red from too hot to touch,
But the DX'er was back and under way, there Harry had,
Used the Novice and his line tap.
And down by Katoomba, where the pine clad ridges raise
Their form and rugged battlements on high.
Where the wind and the rain and the white stars fairly blaze
At midnight in a cold and frosty sky.
And when around the Overflow the red beads were swept and seen
To be wreathed and the rolling cloud the sea.
The Ham from Snowy River had been there word to-day.
And the others tell the story of his win.

a saga of the bug

• Ken Gillespie, VK3GK

P.O. Box 5, Clayton, S168

The word "Bug", whilst being a trade mark, is known in radio circles as the generic name for any mechanical semi-automatic code key. These days the name has even been incorporated in a purely electronic device known as an E1-bug. However it is interesting to follow advertisements for the genuine article over the years.

The earliest such advertisement I came across appeared in a December 1911 magazine and is shown in the facsimile. Notice that it is the Horace G. Martin Vibroplex for \$10 and J.E.

Advertisement from "Modern Electrics"
December 1911

Allbright is the sole selling agent at 253 Broadway, New York.

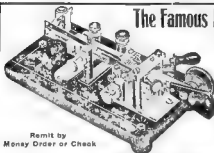
In 1921 it becomes Martin's New Improved Vibroplex Bug and is sold by the Vibroplex Co. Inc. (established 1890) now situated at 825 Broadway and the price is \$17.

By 1931, the Genuine Martin Vibroplex bug is still \$17 but a special radio model is introduced at \$25. The Vibroplex Co Inc. has a J.E. Albright as president. A 1942 advertisement shows Albright still president but the Martin has been deleted and is no longer even

printed on the key. Price has dropped to \$15.95 and the firm is now at 833 Broadway.

The key is an expensive \$24.95 in 1968 from the company at the same address. For the first time, Mr. Albright's name does not get a mention.

I notice that the company still advertises, but not so much of recent times. The original unit can still be bought, but more emphasis is placed on a mechanical device for people making electronic keys. It seems a little sad to see the old keyer being superseded by the self-completing dots and dashes of solid state.



W.I.A. WESTERN ZONE CONVENTION

Will be held at Stawell on Saturday
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Max Grimble,
Wartock Wayside,
Horsham, 3400

Albert Cash, L3289, Victorian Intruder Watch Coordinator shows an intruder teletype printout being received on the 14MHz band.

PROJECT AUSTRALIS

with David Hull VK3ZDH, Chairman, Project Australia

Don VRSBK has had the thrill of making one of the more exotic satellite contacts through Oscar 6. The QSO with 2E7JX was well beyond the normal range of the satellite and Don has the QSL card to prove the contact.

From the log of

GM#	STATION CALLED	RST	FREQ	2 Way	POWER OUTPUT	QSL
W3CZ	7000	599	23.45	DESBY	100	✓

Robert Louth

Commercial Kinks

with Ron Fisher VK3OM

3 Fairview Ave., Glen Waverley, 3150

This month I am going to continue with the FT101 modifications published originally in the English "Mobile News", the journal of the Amateur Radio Mobile Society.

From the October 1972 issue here is some data on front end improvements for early models of the FT101.

"Simply because there must be thousands of FT101's in use throughout the world, in fixed and mobile installations, and because you cannot please all of the people all of the time, we receive a steady stream of suggestions for improving the performance of this ingenious transceiver.

Sometimes the situation gets rather confused since some users complain of faults which are absent in the other owner's sets. What has transpired—is that, whilst all are called FT101, there appear to be subtle differences between the components used in the earliest and later models. This is encouraging in a way, since it shows that the makers are constantly striving to improve overall performance in the light of customers' experiences.

The latest contribution is taken from notes sent to Sandy Duncan GM3OZB/m, by BM2CP from Penang Malaysia, whose permission we have to publish them."

Phil's opening remarks are important and confirm what we have suggested.

... I must warn that not everyone's

problem is the same. This is due to location, strength and frequency of interfering signal (s) etc. as well as model numbers being differently designed. I have also found, when comparing notes on results of modifications, that trouble has also been caused by differences in transistor parameters used in different sets. So with the above preamble I'll get on with the details. Bear in mind they are mostly gleaned from my own personal views, and experience. The problem as I see it can be broken down as follows:

1. Intermodulation caused by several strong out-of-band signals.
2. Spurious unmodulated in-set responses from either the various oscillators or harmonics of them, or those induced by the various diodes.
3. Blocking.

A. The front end diode, DD13, provides some spurious and unwanted signal. It can be removed (if have shorted it out so it can be put back if needed). Then if this is done lift off R49, 1K ohms, or remove it. The 30 pf C122 can be left in circuit, or removed.

B. The latest FT101 has a 14 volt pilot lamp placed in series with this line, I believe as an RF overload protection for the coil windings.

C. If the above is done it is advisable to replace the RF amplifier with a dual gate, diode protected MOSFET. The RCA 40673 is one of the best. I would suggest this change in any case. Any suitable substitute will do.

D. Board PB 10778 There are two main causes of trouble on this board. (a) The first mixer. (b) The local oscillator. After considerable experimentation I found that replacing the first receiver mixer with a BF 173 and the local oscillator with a BC 109

(not 107 or 108) gave excellent improvement to cleanliness of unwanted, out of band signals and 'jingle-bells'. The oscillator certainly needed cleaning up. The latest model FT101 uses a buffer transistor between the L.O. and mixer I tried with some success but could not get both the transmitter and receiver mixers fed with the proper signal levels.

E. My set is now satisfactory. I have one more modification to make and that is to use a double balanced modulator VK5PX and VK5XV swear by this one. I have tried so many mods in the mixer stages that have not improved matters that I am very sceptical about anything now. I am also not even certain now in which mixer the trouble really is. I was inclined to think in the first, then the second, and now I think the trouble is in both. F. The diodes in the noise blanker are another story and this also needs looking into."

Well there you are, go to it and let us know your results.

Before closing for this month, some information on the Fox-Tango Club. It is an association made up mostly of owners of Yaesu transceivers for their mutual benefit. Although originally organised for owners of the FT101, extension to other models is now being considered.

An interesting news letter is published at regular intervals. Milton Lowans WA2AQQ; 3977-F Sedgwick Ave. Bronx, New York. 10463 USA, is the man to contact for details of subscriptions, etc.

My thanks to VK4NS for bringing my attention to this very worthwhile club. ●

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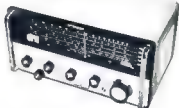
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A.R. 8/73

VHF UHF

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with Eric Jamieson VK5LP

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T mas GNT

In one sense, if by-law entry of VHF equipment is possible, then it could prove detrimental to the hobby by encouraging "the curse" of toy radio, but the possible advantages to be gained from the availability of more sophisticated equipment may outweigh the disadvantages thus introduced. Think about it."

Since that editorial was prepared there has been further discussion of a general reduction of 25 per cent in tariffs which may also have a bearing on the matter. One certainty is that as SSB operation is increasing rapidly on VHF, a logical starting point for a good signal is one of the proven SSB transceivers in conjunction with a transverter.

CONFIRMATION OF RECORD.

The Australian record for 2300 MHz set up on 19th May, 1973 between VK2ZAC/2 and VK2BON/2, operating between Priest's Ridge near Kulnara to Mt. Gibraltar near Mittagong is confirmed. The distance is 159.931 Km (99.376 miles).

To be sure there are many problems to be overcome in the transverter, but a good transceiver halves the problems straight away. Anything which allows better equipment to come into the hands of those prepared to use it intelligently and understanding the state of the art in many more shades, can only be good, particularly as we do not have a large enough amateur population in Australia to adequately support industry along similar lines.

BENDIGO REPEATER

John, VK3AAA, has written with some more information on the Bendigo Channel 4 Repeater. He advises that the repeater is at present operating on low power from Hore Hill. Although Departmental approval has been obtained to relocate to Mt. Alexander (2432 feet a.s.l.) it was the original intention to delay, as a matter of convenience, both this and the increase in power until the question of repeater frequencies was satisfactorily resolved.

It is now felt that, as both of the other existing Ch. 4 systems in Victoria at Geelong and Gippsland have been moved to higher sites, the full extent of co-channel problems should be thoroughly investigated before any changes are made. Consequently, the Bendigo Group has resolved to bring forward the date of relocation so that the extent of the common coverage areas between all three repeaters can be fully assessed before any frequency changes are made.

GENERAL

I have been somewhat out of touch with things this month due to exams, a week suffering with the wogs, and sundry other things like stocktaking, income tax etc., plus many things you would not really care to hear about. Thus news is a bit scarce, but nothing unusual for this time of the year. I note that most of the other publications I have received for the month have been very light on VHF news. Obviously not many people want to write to me. Anyway, we will not waste the Editor's paper, so will close at this point with the thought for the month "A good woman is like a good book: entertaining, inspiring and instructive, sometimes a bit too wordy, but when properly bound and decorated, irresistible." I wish I could afford a library."

The Voice in the Hills.

TASMANIA JUBILEE DIVISION GOLDEN JUBILEE AWARD

Following is a list of applicants who have successfully claimed and been awarded Certificates.

1	ZM3RK	18	ZL2IK
2	ZL3VJ	19	ZL3UJ
3	VK3BYR	20	VK3FV
4	ZL3CA	21	ZL3JN
5	ZL3AP	22	ZM3PWF
6	VE6ED	23	VK3ARZ
7	ZL2GA	24	ZL2AGZ
8	VE6SM	25	ZL3KO
9	ZL2AH	26	ZL3AGO
10	ZM2JAN	27	VK3L
11	VK3JN	28	VK3KA
12	ZM3ACZ	29	ZL3ACS
13	ZM3SX	30	VK3APL
14	ZL3CZ	31	VK3BZ
15	VK3APU	32	VK3APU
16	VK3BR	33	ZL3JAZ
17	VE6BMP		

20 Years Ago

with Ron Fisher VK3OM

September 1953

The VFO at VK3VM, by Jack Duncan, VK3VZ, headed the tech part articles in the September issue of AR. As well as being technical editor of Amateur Radio, Jack was closely associated with the design and construction of the transmitting equipment at VK3VM, where this station is located in Queen Street in the heart of Melbourne.

Jack's VFO was based on the then easily obtainable Command transmitter. Stability of the completed unit averaged better than 5Hz in a one minute period, which would be considered good even with today's sideband gear as you are considering using a Command transmitter as a VFO, reference to this article would be very smart while.

Part three of "Amateur Television" by E. Cornelius, VK3EC, described a synchronising signal generator. This was an article with lots of good information, including data on trigger multi-vibrators, step counters, decoders and limiters.

VK3RK's DX notes reported the first amateur contact between Australia and Easter Island which was checked up by VK3KB who wanted CQAA 40 meter CW. Other DX at the time was just so, VK's working all the DX over this period included VK2ADU, VK2AMB, VK3VNH and VK3VJ.

Commercial interference in the 7MHz band is certainly not a new problem. Federal Notes report that representations have been made to Mr R. G. Casey, Minister for External Affairs, and the Hon. J. Mason, General, Mr M. L. Anthony regarding transmissions from Radio Pakistan. Both these gentlemen promised to take action on the matter.

Y.R.C.S.

with Bob Gutherlet

Methodist Manse, Kadina, S.A., 5554

NEW VKS SUPERVISOR

We welcome Mr N. H. Hyde of the Hamilton Senior High School, who has taken over from Laurie Jackson to whom we express our thanks for services rendered in the West. Ironically, it would seem that communication is a major problem in Y.R.C.S. Ken Watson is a S.A. radio enthusiast who has been a New-wave club. The new supervisor in W.A. wrote to the supervisor in another state and after several months came to the conclusion that the said person was either deceased or suffering from rigor mortis. S.A. supervisor, Allan Dunn, commenced a recent letter as follows: "Just so that it cannot be said that the S.A. Supervisor is slow in keeping the Federal Co-ordinator informed, here is the latest on the YRCS situation in VKS." Welcome to Noel Kohler, the new S.A. State Secretary. June annual meeting of the S.A. area discussed the proposed new syllabus and favoured provision being made up to ACPD level.

Congratulations to the Matland Radio Club in having been awarded, for the fourth time, the pennant from the Institute of Radio and Electronic Engineers of Australia. This added clause is promoting a new building scheme which, when completed, should prove an outstanding contribution to the advancement of YRCS in that state. It is noted that Matland has the backing of civic and district organizations, an area which other clubs could consider. The YRCS has nothing to hide and much to publicize. We congratulate the Marsh Bros. High School Radio Club in winning the pennant for the non-scholar radio club, with its leader, Bro. Cyril, who received his ACPD through instruction in the Matland club.

On the Federal level, I have requested State Secretaries to form the Council, for permission to have the constitution amended as follows. Article (6) sub section (f) "To exercise such authority as may be necessary in the development of, and in the interest of, Y.R.C.S. This added clause is enabling the co-ordinator to make such decisions as may be required between internal meetings.

We are hoping that the Syllabus Committee will be able to finish its complete and adequate decision on our teaching notes when the Novice Licence details are available. In the meantime, we have the task of promoting the scheme with publicity and achievement. As communication is one of our major tasks, supervisors please keep me informed of any major movements in their respective states.

AMATEUR BEACONS

	BAND
VK0	12.60 VK0W1, Macquarie Island.
VK0	53.100 VK0MA, Mawson.
VK0	53.000 VK0GR, Casey.
VK2	52.450 /K2W1, Dural.
VK3	144.700 VK3RTQ, Vermont.
VK4	52.600 VK4W1/2, Townsville.
VK4	144.600 VK4W1/1, Mt. Mowbulla.
VK5	53.000 VK5VF, Mt. Lofy.
VK6	144.800 VK6VF, Mt. Lofy.
VK6	52.008 VK6VF (VK6RTV), Bickley.
VK6	52.900 VK6RTT, Carnarvon.
VK6	144.500 VK6RTW, Albany.
VK6	145.000 VK6VF (VK6RTV), Bickley.
VK7	144.900 VK7RTX, Devonport.
VK8	52.200 VK8VF, Darwin.
ZL1	145.100 ZL1VHF, Auckland.
ZL2	145.200 ZL2VHF, Wellington.
ZL2	145.260 ZL2VHF, Palmerston North.
ZL3	145.300 ZL3VHF, Christchurch.
ZL4	145.400 ZL4VHF, Dunedin.
JA	52.500 JA1HGY, Jeju.
HL	50.100 HLW51, South Korea.
	52.010
KX6	90.110 KX6HK, Marshall Islands.

NEW W.A. DIVISION

The page takes the opportunity on behalf of the VHF fraternity in wishing the newly formed A.C.T. Division of the Wireless Institute of Australia every success in the future, the formation of which was instigated by the Canberra Radio Society an organisation of some 22 years standing. The first meeting of the new Division was held on 23rd July, 1973, the President being John Austin VK1JL, and Secretary Andrew Day VK1DA. The A.C.T. Division Federal Council is the well known VHF operator (and HF of course) Eddie Park a VK1VP. New members and visitors will be welcome at meetings and other activities, and information may be obtained by writing to the Institute at P.O. Box 1173, Canberra City, A.C.T. 2601.

BY-LAW ENTRY OF EQUIPMENT

The Editorial by Roger VK2ZTB in the July issue of "B.U.P." on the above subject makes sensible reading, and food for thought and as there is room in this month in the column I think the comments should be digested by wider group of people. I therefore quote:

The recent announcement that amateur equipment may be brought into Australia under by-law entry will be welcome news to many. It will probably stimulate activity to a certain extent, but I note from the information received that VHF equipment appears to be excluded. Now, one does not really know whether to look upon this as a blessing or a curse. If VHF equipment is included then the increase in "appliance operators" is likely to be considerable. Now this is not necessarily detrimental as it can be argued that, after all, appliance operators do populate the bands thus saving it for the experimentalists/technicians from the clutches of commercial encroachment.

But then appliance operators are notorious for being confused by more than three knobs or switches and thus will tend to buy either the simpler FM equipment or the fully automatic variety. Consequently, they will congregate on the FM nets which is not necessarily a bad thing either. Less QRM and confused operating on the other hand.

Then again, more people should be encouraged to operate tuneable, and the relatively sophisticated equipment that comes within reach of the pockets of more people allows (and indeed encourages) them to indulge in such activities as meteor scatter, troposcatter etc. which will do the good. It also allows contact with those experimenting with UHF or sophisticated communications methods or circuits, which can only be a good thing in the long run.

Contests

with Peter Brown VK4PJ

Federal Contests Manager, G.P.O. Box, 638
Brisbane, Ql., 4001

CONTEST CALENDAR.

September 1 - 2: Gold Coast Amateur Radio Club Field Day
September 8 - 9: Worked All Europe DX phone Contest
September 15 - 16: The 15th Scandinavian Activity Contest, CW
September 22 - 23: The 15th Scandinavian Activity Contest, phone
October 6 - 7: VK ZL Oceania, phone. Do your bit with the mike
October 13 - 14: VK ZL Oceania C W More VK CW operators needed
October 13 - 14: RSGB 21-28 Mhz phone
October 20 - 21: RSGB 7 Mhz CW
October 27 - 28: CQ-WW-DX phone
November 3 - 4: RSGB 7 Mhz phone
November 11: Czechoslovakian contest
November 18 - 25: CQ-WW-DX CW contest
December 8 to January 20: Ross Hk Memorial VHF-UHF Contest Rules in next month's Amateur Radio
February 9 and 10: John Morley Memorial National Field Day
February 24: Central Coast Amateur Radio Club Field Day, VK2

When is your Club or Division holding a contest?

WHAT AGAIN???

Yes, again I mention the VK ZL Oceania, on October 6 - 7 and 13 - 14, and the importance of "Flying Australia's flag" in the International field. Put in a good effort for your country and build up your state's presentation. There is every chance that you could work DXCC on that weekend. Get on the air and the bands will not be "dead". You will note that the RSGB 21-28 Mhz phone contest is on one of the weekends so you may be able to squeeze a few CW contacts out of those bands.

Also in October and November are the popular CQ-WW-DX phone and CW contests. Keep the dates clear for a few hours at least.

Unofficial CW Contest.

Thanks to the operators who wrote to me of the above contest, and told me that few knew what the contest is about, and that all seem to be experienced operators. The best log for June was VK4QJ - 17 contacts.

June VK3XB - 27 contacts to come.

I guess that if we do not try we certainly shall not succeed in developing CW. VK3 led easily . . . no VK4s at all.

Frank VK4H has yet to get his tower up at a new QTH or he would be on. Let us carry on to November and see if the CW contest is worthwhile.

Here are the simple rules:
Third Sunday 15 Sept., 20 Oct., 17 Nov., 0800-1400GMT 16 m, 12 pm EAST) Bands 80, 40, 20 CW-only all VKs only. One point per contact, one contact per station per band. No log, your Call sign and score only. No shagshaggers either. You will note that there are CW contests on Sept and Oct dates.

1972 CQ-WW DX Contest results, Australia Band Points Contacts Zone Countries

VK2JL 14Mhz	29580	128	25	69
VK3PJ A11	11608	168	47	89
VK3SM 21 Mhz	15880	124	20	25
VK3ARY 14 Mhz	35208	183	25	47
VK4FH A11	129168	162	43	65
VK4AK 11	14816	122	53	65
VK4PJ 28 Mhz	5068	56	12	20
VK4DO 14 Mhz	34224	138	32	61
VK6MF A11	46325	138	32	61
VK6NS 11	5412	83	10	19
VK6HD 14 Mhz	706251	1483	37	132

Congratulations VK6HD on a fine effort.

EX-G CONTEST The week-end of 10th/11th November (first week and after 5th Nov I turn po.ooz on Saturday to 23.58 on Sunday any mode and licensed frequency Objects of the contest are to publicise reciprocal operating privileges Worldwide and to promote links between the Ex-G Club, Overseas British residents and amateurs in the UK. Only 24 hours total operating time may be counted in the contest period.

Ask your G Contacts or a member of the Ex-G Club for further details if you are interested in this contest

Magazine Index

With Syd Clark, VK3ASC

BREAK IN January/February 1973.

Special "Amateur Radio Regulation Issue". Commemorating 50 years of Amateur history in the "shaky rules". Very interesting

March 1973

Hamburg Westport by the Rolly Route, Marine ST-6 Demodulator for RTTY, Frequency Shift Keying, Operational Amplifiers, Calibration of a Frequency Meter

April 1973

The Story of Time; C W Impending Demise?; How to Recreate a Half Wave Antenna; The Morse Code and its problems, N.Z.A.R.T.I. Annual Report

CQ-TV, February 1973.

Circuit Notebook No. 12, European Amateur TV Reporting System, Ideas for Amateur Colour Part 5, 1972 ATV Contest Results, Receiving Amateur TV for the Beginner, Slow Scan News, A Flying Spot SSV Scanner, Integrated Circuits, Part 11

HAM RADIO March 1973.

Solid State 80 Meter SSB Transceiver, All Mode Compensator Receiver, Phase Locked Loop AFK Generator Radio Frequency Interference, How to use Ferrite Beads; Simple Integrated Circuit Electronic Keys; Crystal Test Oscillator and Signal Generator, Solid State Mobile Touch Tone Circuit; HW-16 Modifications for VFO Operation

HAM RADIO, April 1973

Solid State Two-Meter FM RF Power Amplifiers, The Vertical Radiator, Phasing Type SSB Generator, RF Phase Meter, Sensitive RF Indicator; Simple Regenerative VHF Receiver, First Wireless in Alaska, How to make your own Printed Circuit Boards, Speed Standards for Inspirational Morse Code.

MOBILE NEWS, March 1973.

Choosing a Location for Portable Operation; Suppression and the Ford Cortina

April 1973.

Choosing a Location for Portable Operation; Variable Frequency Oscillator for the FT-73; Comment General Mobile Chatter and some technical information

QST April 1973.

A Solid-State SSB Generator with Digital Readout, A Band-Edge Marker Generator, Field Day Filters (For keeping strong signals out of adjacent receivers); Combination High-Stability Two-Tone Generator and Calibrator Calculating Vertical Pattern of Repeater Antennas; Fundamentals of Solid-State Power Amplifier Design Part 3; Another Look at Reflections Part 1, The Dual Six - A ORP Transmitter for 40 and 80 metres, Reviews of: Hal Communications RYD-1002, RTTY Video Display Unit and RK8-1 VTY Keyboard, The Hal ST-6 RTTY Demodulator, Dipper-80 Frequency Counter and Dipper 180 Converter

May 1973.

A Medium Power HF SSB CW Transmitter An Antenna Changeover System and Power Output Indicator, Precise Frequency Measurement with Amateur Equipment, A Pair of Handy Testers, A Practical 40 metre Quad, Transceiver Operation for the Heath HW-10, Heat Losses in Power Transformers (Recommended) Range Measurements with Oscar 6, Reviews of Omega FM 278 FM Transceiver, Kamwood (Trio) TS51S Transceiver

RADIO COMMUNICATION April 1973.

Audio Frequency Interference (AFI) (Suppressing troublesome Hi-Fi interference), An Inexpensive VHF Aerial: Review of FTDX-401 Transceiver, Break In and Listening Through, A Note on Kits, Technical Topics, Microwaves

May 1973.

A Most System for Dish Aerials, A Shack Earthed Folded Vertical for 14 MHz: A Modern Approach to Radio Telemetry, The "Yet another" Keyer, All Band Portable Aerial

RADIO COMMUNICATION June 1973.

The G3XGP Frequency Meter, Quad Aerials at VHF, Progress Report on the GB3 PL Repeater Experiment, The Solar Events of 5 August 1972, Plus all the usual features

SHORTWAVE MAGAZINE March 1973.

Adaptable 30-watt Transmitter, Two Aerial Ideas, Aerial Current Meter, Sideband Transverter for Two Meters

SHORT WAVE MAGAZINE April 1973.

Sideband Transmitters for Two Meters, Front End Tuning, Inexpensive Dummy Load, F.S. Meter for 23 Centimetres, Looking at the K W Atlanta, Crystal Mic Amplifier

73 MAGAZINE February 1973.

A TL Logic CW ID Generator, The Evolution of Spectrum Management, Phase Locked Loop Decoder, Toroidal Quadrature Antenna Applications for An Active Filter, Time-Frequency Measuring System Part 2: Repeater Keying Line Control, Popular Sow Scan Television Circuits, Part 1, A 2 Mhz Converter for an AM FM Broadcast Receiver, All Purpose Metering Circuit, Are FETs Really Better? Frequency Counter Input Circuit, TR 22 Modification (Higher Power Output) Transistor RF Power Amplifiers, Part 1 Light Bulbs as RF Power Indicators, Economy Filters for the Collins 75-A4, CMBFS Adapting Electronic Keys to Older Transmitters, Gonet Linear Modification, A Time for Everything

73 MAGAZINE March 1973.

A Fast Scan Facsimile System with SSVT Compatibility, The Easy Way to Six and Two Meter High Power, Solid State Repeater Control, A Digita Tone Distributor for RTTY, The Ample Amplifier, Popular SSVT Circuits, Part 2, The Can Scanner, Improving the Indoor Antenna System, Updating Sorenson "A" Nobostons, FM Deviation Meters, Time-Frequency Measuring System, Part 3: Another use for 600 cycle Transformers, Bandpass Filter Design

73 MAGAZINE April 1973

If You Don't Have a Mountain, Low Cost FM Deviation Meter, Taming Those Hot 500 Mhz FETs for 2M FM, Two More Two Meter Amplifiers, "Mini" Repeater Control System Part 1, Getting Your Repeater Licensed, Low Temperature Techniques for Radio Amateurs, Choosing Your FM Rig, Europe on 2 Meters a Day, Scanning Adapter for FM Transceivers, The RCA CNU15 FM Transceiver, 2 Meter FM at 14 000 Feet, Simple Lightning Detector, Citizens Band Alignment Aid, Heath Desk Top Calculator, Transistor RF Power Amplifiers, Part 2, Repeater Economic International Signals's 100 Milliwatt Rig Revisited

SHORT WAVE MAGAZINE May 1973.

Knowing about SSVT Antenna Noise Bridge, Absorption and Indicating Wave meters

CQ - June 1973.

Tuning In On Touch Tone Pads, Omni-Gain Antenna on 2 Meters F.M., SSVT Flying Spot Scanners, Un-derstanding Ten Metre Propagation, Converting the Western Union Telefax Machine For Use in the Amateur Service.

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